Sanford Quadrangle, Maine

Surficial geologic mapping by
Craig D. Neil

Digital cartography by:
Robert A. Johnston

Robert G. Marvinney
State Geologist

Cartographic design and editing by:
Robert D. Tucker

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Maine Geological Survey
Address: 22 State House Station, Augusta, Maine 04333
Telephone: 207-287-2801 **E-mail:** mgs@maine.gov
Home page: http://www.maine.gov/doc/nrimc/nrimc.htm

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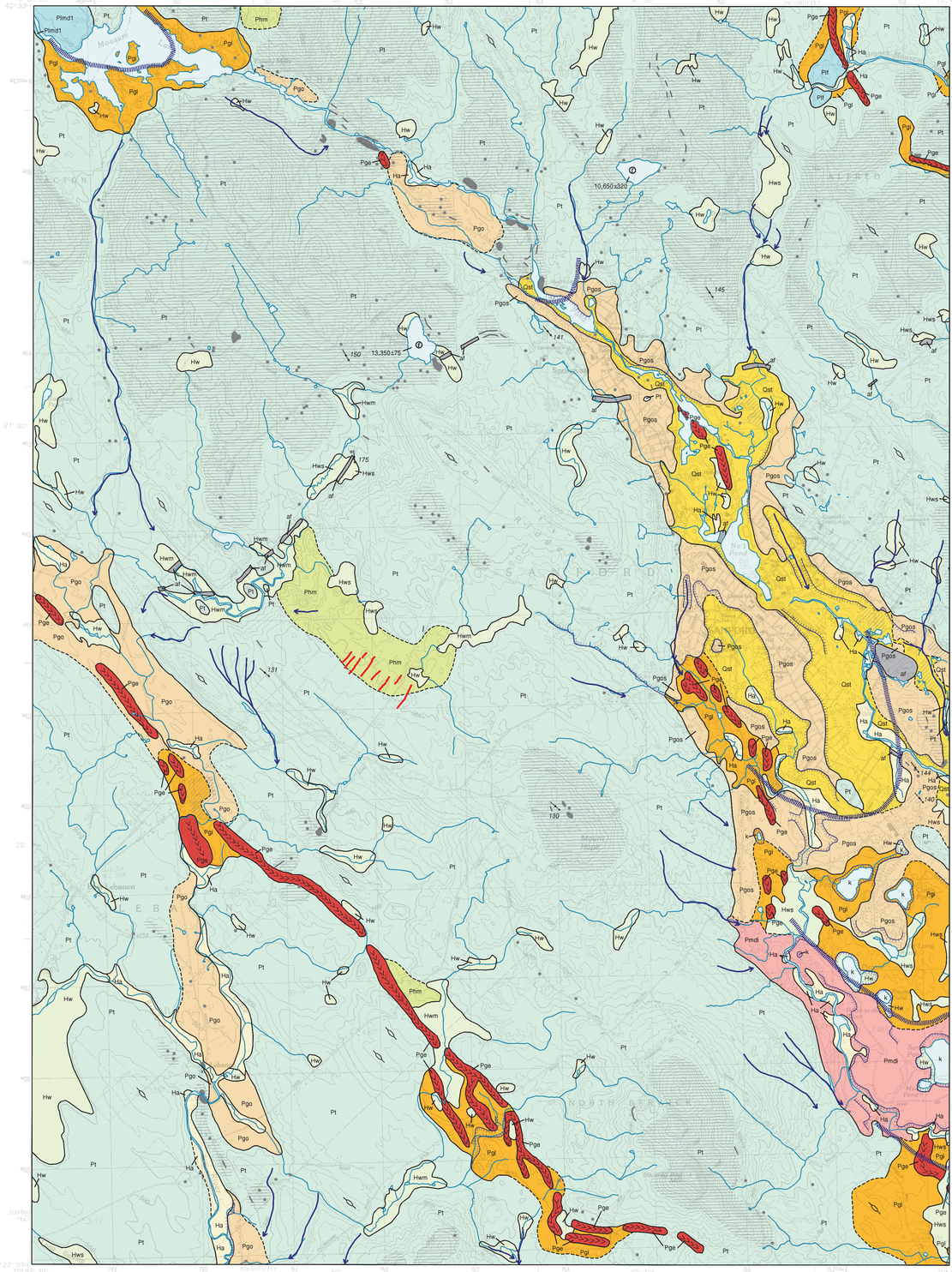
For additional information,
see Open-File Report 97-70.

Surficial Geology



SOURCES OF INFORMATION

Surficial geologic mapping by Craig D. Neil completed during the 1995-1998 field season; funding for this work provided by the U.S. Geological Survey STATEMAP program. J. Michael Clinch conducted additional surficial materials field work during the 1989 field season, funded by the Maine Geological Survey. Geologic unit designations and contacts revised and matched to adjacent quadrangles in 1999 by MGS geologists.

Quadrangle Location

SCALE 1 : 24,000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

TRUE NORTH

Topographic base from U.S. Geological Survey Sanford quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on this map is for location purposes only and does not impute responsibility for any present or potential effects on the natural resources.

Note: The first letter of each map unit indicates the general age of the unit.
H = Holocene (postglacial deposit; formed during the last 10,000 years)
Q = Quaternary (deposit of uncertain age, but usually late-glacial and/or postglacial)
P = Pleistocene (deposit formed during glacial to late-glacial time, prior to 10,000 years B.P. (before present)

Units in legend are arranged generally from youngest to oldest.

Ha — **Stream alluvium** - Sand, silt, gravel, and organic material. Deposited on flood plains of modern rivers and streams.

Hw — **Wetland deposits** - Peat, muck, and fine-grained inorganic sediments. Deposited in poorly drained areas.
Hws - wooded swamps
Hwm - marsh
Hw - undifferentiated wetlands

Qst — **Stream terrace deposits** - Sand and gravel deposited on erosional terraces at elevations between the original Sanford outwash plain surface and the modern flood plain.

Pgo — **Glacial outwash** - Undifferentiated glaciofluvial sand and gravel deposited in the Little and upper Mousam River valleys.

Pif — **Lacustrine fan deposits** - Deltaic sand and gravel deposited into glacial lakes in the Middle Branch Mousam River and Stub Marsh valleys.

Plmd1 — **Lacustrine delta deposit** - Deltaic sand and gravel deposited into glacial Lake Mousam. Corresponds to Plmd, of Boothroyd (1997) and Meglioli and Thompson (1997).

Pgl — **Ice-contact deposits** - Undifferentiated sand and gravel deposits formed in contact with melting glacial ice.

Pge — **Esker deposits** - Sand and gravel deposited by meltwater streams in glacial tunnels. Chevrons indicate inferred direction of glacial stream flow.

Phm — **Hummocky moraine** - Glacial till with hummocky topography. Usually contains many boulders. Lenses of sand, gravel, and silt are locally abundant. Unit may also include moraine ridges probably formed at the glacier margin during recession of the last ice sheet.

Pgos — **Sanford outwash plain deposits** - Glaciofluvial sand and gravel deposited as an extensive outwash plain in the Mousam and Great Works River valleys.

Pmdl — **Marine delta** - Ice-contact, glaciomarine delta deposited in the Mousam and Great Works River valleys.

Pt — **Till** - Loose to very compact, poorly sorted, mostly non-stratified mixture of sand, silt, and gravel deposited by glacial ice. Locally contains lenses of water-laid sediment.

af — **Artificial fill** - Man-made unit. May be composed of any material. Commonly seen as highway and railroad embankments, and landfills.

Bedrock and thin drift - Gray areas are individual outcrops. Ruled pattern indicates areas where surficial sediments are generally less than 10 ft thick.

Contact - Boundary between map units. Dashed where approximate.

Scarp - Scarp separating higher and lower terraces in a single map unit or marking a boundary between adjacent units.

Ice-marginal position - Line shows an approximate position of part of the glacier margin during ice retreat, based on ice-contact topography and/or meltwater channels. Label, when present, indicates map unit deposited, at least in part, from this position.

Moraine ridge - Line shows crest of moraine ridge in area mapped as till or hummocky moraine.

Glacially streamlined hill - Symbol shows trend of long axis, which parallels former ice-flow direction.

135 **Glacial striation locality** - Arrow shows ice flow direction (azimuth in degrees True) inferred from striations. Dot marks point of observation.

<<<<< **Esker ridge** - Boundary shows extent of esker tunnel deposit. Chevrons indicate inferred direction of stream flow.

k **Kettle** - Depression created by melting of buried glacial ice and collapse of overlying sediments. Often occupied by ponds (e.g. kettle ponds).

Disturbed land - Area where original topography has been modified or obliterated by excavation.

Meltwater channel - Channel eroded by glacial meltwater stream or drainage from glacial lake. Arrow shows inferred direction of former stream flow.

10,150±450 **Terrestrial fossil locality.**

REFERENCES

Boothroyd, J. C., 1997, Surficial geology of the Great East Lake 7.5' quadrangle, York County, Maine: Maine Geological Survey, Open-File Map 97-46.

Meglioli, A., and Thompson, W. B., 1997, Surficial geology of the Mousam Lake 7.5' quadrangle, York County, Maine: Maine Geological Survey, Open-File Map 97-59.

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

1. Neil, C. D., 1997, Surficial geology of the Sanford 7.5-minute quadrangle, York County, Maine: Maine Geological Survey, Open-File Report 97-70, 9 p.
2. Neil, C. D., 1998, Surficial materials of the Sanford quadrangle, Maine: Maine Geological Survey, Open-File Map 98-174.
3. Neil, C. D., 1998, Significant sand and gravel aquifers of the Sanford quadrangle, Maine: Maine Geological Survey, Open-File Map 98-140.
4. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological Survey, 68 p. (out of print)
5. Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.
6. Thompson, W. B., Crossen, K. J., Borns, H. W., Jr., and Andersen, B. G., 1989, Glaciomarine deltas of Maine and their relation to late Pleistocene-Holocene crustal movements, *in* Anderson, W. A., and Borns, H. W., Jr. (eds.), Neotectonics of Maine: Maine Geological Survey, Bulletin 40, p. 43-67.